

San Joaquin Renewables Class VI Permit Application Quality Assurance and Surveillance Plan

Prepared for

San Joaquin Renewables LLC
McFarland, California

Submitted to

U.S. Environmental Protection Agency Region 9
San Francisco, California

Prepared by



DBS&A
Daniel B. Stephens & Associates, Inc.

a Geo-Logic Company

43 Randolph Road, #129
Silver Spring, Maryland 20904
www.dbstephens.com
Project # DB19.1252.SS

December 22, 2021

Table of Contents

| | | |
|-------|---|----|
| 1. | Introduction and Background..... | 1 |
| 2. | Project/Task Description | 1 |
| 3. | Quality Assurance Objectives and Criteria | 2 |
| 3.1 | Data Generation and Acquisition | 2 |
| 3.1.1 | Laboratory Management..... | 2 |
| 3.1.2 | Field Instrumentation..... | 2 |
| 3.1.3 | Field Sampling Methods..... | 5 |
| 3.1.4 | Laboratory Analytical Methods..... | 7 |
| 3.1.5 | Quality Control Samples..... | 7 |
| 3.1.6 | Sample Handling and Custody | 8 |
| 3.1.7 | Data Management and Reporting..... | 8 |
| 3.2 | Measurement Performance and Acceptance Criteria | 9 |
| 3.2.1 | Field Instrumentation..... | 9 |
| 3.2.2 | Laboratory Reporting Limits | 9 |
| 3.2.3 | Data Validation and Usability | 9 |
| | References..... | 10 |

List of Attachments

- A Downhole Intrumentation (in-situ and wireline)
- B Kuster, Hydrasleeve and PDB Groundwater Sampler Specifications
- C Laboratory Methodologies, Reporting Limits, and Sampling Specifications

1. Introduction and Background

This Quality Assurance and Surveillance Plan (QASP) is a component of the San Joaquin Renewables, LLC (SJR) application to the U.S. Environmental Protection Agency Region 9 (U.S. EPA) for an Underground Injection Control (UIC) Class VI permit for the proposed San Joaquin Renewables (SJR) facility near McFarland, California. This plan is one of several separate documents submitted to the U.S. EPA Geologic Sequestration Data Tool (GSDT) and includes required information regarding quality assurance tasks and methodology associated with planned testing and monitoring activities. Daniel B. Stephens & Associates, Inc. (DBS&A) prepared this QASP per 40 CFR 146.90(k) and United States Environmental Protection Agency (EPA) guidance (EPA, 2012).

2. Project/Task Description

As described in the testing and monitoring plan (DBS&A, 2021), the project includes the following primary field tasks listed below:

- Injectate stream analysis (laboratory sample analysis)
- Injection well pressure, rate, and volume monitoring (wellhead and in-situ monitoring instruments [screen interval] with downhole logging)
- Injection well casing corrosion monitoring (laboratory sample analysis and downhole logging)
- Injection well mechanical integrity testing (downhole logging)
- Groundwater quality monitoring (in-situ monitoring instruments [screen interval] and laboratory sample analysis)
- Geophysical (seismic) surveying (plume tracking of CO₂ saturation)

3. Quality Assurance Objectives and Criteria

The quality assurance (QA) objectives and criteria are outlined below for each project task as applicable.

3.1 Data Generation and Acquisition

Data measurement and generation will be completed by external fixed commercial laboratories and by field instrumentation (dedicated in-line; downhole in-situ; downhole [wireline] logging; or portable instruments). The SJR facility will operate and maintain its own onsite fixed laboratory for routine injectate analyses while commercial laboratory analyses will be contracted for periodic QA checks against the onsite laboratory performance. QA procedures for data generation and acquisition are described below.

3.1.1 Laboratory Management

Specialized off-site fixed laboratories will operate under their facility-specific QA manual for the analytical services provided by that laboratory. Injectate stream analysis will be provided by TRI Air Testing (Round Rick, Texas) (or equivalent). Groundwater sample analysis will be provided by Eurofins Calciene in Garden Grove, California (or equivalent). Corrosion coupon testing analysis and/or American Society of Testing Materials (ASTM) analyses will be conducted by Zalco Laboratories Inc. in Bakersfield, California (or equivalent). Each laboratory will be required to maintain the appropriate certification and accreditation for each analytical service that is provided. The SJR facility will operate and maintain its own onsite fixed laboratory for routine injectate analyses. Laboratory analytical methods are specified in Section 3.1.4.

3.1.2 Field Instrumentation

Field instrumentation, including downhole logging tools, will be utilized for a variety of project measurements such as wellhead injection pressure (P), temperature (T), rate and volume; injected mass (flowmeter); in-situ groundwater pH, P, T, specific conductivity, dissolved oxygen (DO) and dissolved carbon dioxide; and well casing corrosion parameters.

Per U.S. EPA guidance the perforated interval of the above-confining zone (ACZ) well will be screened in the lower Olcese formation approximately 7,045 to 7,095 ft bgs (50-foot well screen interval) pending verification of stratigraphy upon drilling of the injection well. The IZ monitoring well will be perforated exclusively within the Vedder formation, which is

approximately 6,672 ft bgs at this location pending verification of stratigraphy upon drilling. The IZ monitoring well will be fitted with a downhole transducer for continuous pressure measurement such as an ESI Hispec® HI5000 (Attachment A).

Field instrumentation will be installed or operated downhole, at the wellhead, or integrated in-line. A specialty vendor (i.e. Schlumberger®, Probe® or Horiba®) will be contracted to provide the instrumentation and assist with suitability analysis, customization (if needed), installation, calibration and maintenance where possible. Specialty geophysical survey instrumentation and equipment will also be used for 3D seismic survey data collection and analysis (CO2 plume tracking).

Each dedicated field instrument will be procured new from an authorized manufacturer or manufacturer's representative and maintained for dedicated project use. Each instrument will be calibrated, installed and maintained according to the frequency and methodology of the manufacturer's guidelines, specifications and requirements. Any instrumentation determined to be out of calibration will be immediately taken out of service and replaced. As a result, select stand-by replacement units will be procured and maintained for immediate project use. Instrumentation will be registered with the manufacturer in order to maintain correspondence regarding possible unit upgrades, modifications, or product recalls.

As possible, portable and fixed instrumentation will be installed and/or operated in a redundant manner, that is, duplicate instrumentation will be installed in series or parallel in order to evaluate and verify the precision of real-time measurements. Duplicate field instruments will be procured and deployed during routine measurements as possible. Each portable or fixed unit will be individually numbered and labeled so each measurement is assigned to a specific individual instrument.

Portable field instruments will be maintained in a dedicated, access-restricted (locked) and secure location between project measurement events and returned to storage after each use (including locked field vehicle storage). The storage unit or vehicle will be moisture and temperature-controlled as required for each instrument. Portable equipment will be deployed to a field task assignment with a sign-out/sign-in (return) sheet documenting the technician, date, and project use/location. Only properly trained staff will be permitted to operate portable field instrumentation. Rental equipment procurement and deployment (i.e. geophysical survey equipment or others) will be completed as noted above where applicable.

The manufacturer registration, documents and specifications such as model number, unit number, factory calibration, and factory registration will be maintained in the master project files. Operational manuals will be maintained in the master project files with a copy maintained with instruments in the field.

Field measurements will be redundantly conducted in duplicate or triplicate as possible with competing instruments to promote consistent and representative measurements.

Example specification sheets for in-situ and wireline logging instruments are included in Attachment A. Comparable in-line instrumentation upstream of the wellhead (pre-injection) is anticipated to be installed for injection P, T and injection rate. Downhole in-situ instrumentation may be installed within the ACZ and injection zone (IZ) monitoring well screen intervals for in-situ groundwater P, T, DO, specific conductivity (i.e. Probe® KPerm™ Multi-Drop Piezo Downhole Gauge) and, if a sensor is available, dissolved CO₂. Downhole monitoring well instrumentation must be rated for the anticipated elevated water pressure at approximately 10,000 feet of water column depth.

Downhole logging tools are anticipated to be deployed by wireline for downhole P and T (to complement in-situ data), mechanical integrity testing, and well casing corrosion analysis (to supplement corrosion coupon testing). Downhole logging tools will be utilized for mechanical integrity testing prior to injection, and annually, using downhole P/T logging instrumentation. If needed to resolve or complement T logging data, a downhole oxygen activation (water flow) logging tool such as the Probe® Reservoir Analysis Sonde Sigma HD (pulsed neutron tool) may also be deployed.

Downhole logging tools will be utilized for corrosion monitoring on a semi-annual basis as follows:

- Ultrasonic imaging log (or equivalent) to gauge casing inside and outside roughness and thickness, casing to cement bond.
- Multi-finger caliper to evaluate inner metal loss.
- Electromagnetic flux log to evaluate total metal loss.
- Downhole video if necessary to identify casing problems where other logs may be ambiguous.

The following instrumentation (or equivalent) provided by Probe® (or an equivalent vendor) will be evaluated for applicability and modified or customized as needed for the corrosion parameters listed above (Attachment A):

- Ralii® Cement Bond Tool
- Promac™40 Multi-arm Caliper Tool
- IQ™ Magnetic Properties Tool

Wellhead cellular telemetry (Hach Claros® or equivalent) will be installed to enable web-based real-time remote monitoring of downhole in-situ instrumentation. A reputable, established, and reliable commercial vendor will be identified to install and maintain this system.

3.1.3 Field Sampling Methods

Field sampling methodology is not applicable to in-stream, in-line, downhole logging or downhole in-situ dedicated instrumentation or geophysical surveying. Field sampling methods are specified below for:

- Injectate stream sampling
- Groundwater sampling
- Well casing corrosion testing

3.1.3.1 Injectate Stream Sampling

Injectate stream quality will be sampled for third-party fixed laboratory analysis as a quality check of the on-site fixed laboratory analyses. The carbon dioxide stream ahead of the injection well will be collected directly into specified sample containers without any required pre-sample in-line purging. An in-line sampling valve will be installed as needed to facilitate routine sampling. Samples will be extracted upstream of the wellhead and may be allowed to decompress into the vapor phase within a sample container for analysis. Samples can be also collected as liquified compressed gas or gaseous (vapor) samples as needed according to analytical laboratory specifications. Laboratory analytes and methods are presented in Section 3.1.4.

3.1.3.2 Groundwater Sampling

Groundwater sampling will be conducted in the above confining zone (ACZ) well installed at the SJR property. Per U.S. EPA guidance the perforated interval of the ACZ well will be in the lower Olcese formation approximately 7,045 to 7,095 ft bgs (50-foot well screen interval) pending verification of stratigraphy upon drilling of the injection well. ACZ well groundwater sampling will be conducted using passive diffusion bag (PDB) samplers or a discrete-depth sleeve sampler (Hydrasleeve® or equivalent). PDB or sleeve samplers will be verified in advance for suitability and performance at the well screen depth. A wireline system with a timed discrete-zone sampling device (e.g., Probe® Kuster® sampler or similar) (Attachment B) capable of collecting an in-situ sample from a specified depth interval may also be deployed for in-situ groundwater sampling.

In-situ water quality parameters pH, specific conductivity, temperature and dissolved oxygen (DO) and carbon dioxide (if feasible) will be monitored with dedicated in-situ instrumentation installed within the well screen interval during well construction (Section 3.1.2).

Groundwater sampling will also be conducted in underground sources of drinking water (USDW) wells (potable supply wells) in the project vicinity. These wells are already routinely sampled and SJR will seek permission to collect additional sample volume during routine sampling events to be conducted by Southern San Joaquin Municipal Utility District (SSJMUD). SJR will evaluate the SSJMUD sampling methods going forward and request accommodation for specific parameters (such as in-situ carbon dioxide) if needed. Laboratory analytes and methods are presented in Section 3.1.4.

3.1.3.3 Well Casing Corrosion Testing

Field well casing corrosion testing will be conducted according to the methods specified in ASTM G1-03 or National Association of Engineers (NACE) International TM-01-69 (or an approved equivalent) that are tailored to the field environment in-line and upstream of the injection wellhead. The testing will be conducted in a systematic, repeatable field procedure fully documented to provide for independent QA review and verification at any step in the procedure. Duplicate and redundant testing will be conducted at least at a frequency of 10 percent.

All calculations will be independently checked and confirmed and each analysis will be cross-checked for compliance with the approved methodology. Written documentation will provide a record of the QA review. Laboratory analytes and methods are presented in Section 3.1.4.

3.1.4 Laboratory Analytical Methods

The parameters and analytical laboratory methods for injectate stream analysis are listed below:

- Total sulfur (International Society of Beverage Technologists [ISBT] 14.0 or ASTM D3246)
- Hydrogen sulfide (ISBT 14.0 or ASTM D1945/D6228)
- Nitrogen (ISBT 4.0) or ASTM D1945)
- Total Hydrocarbons (ISBT 10.0 or ASTM D1945)
- Methane (ISBT 10.1 or ASTM D1945)
- Carbon dioxide purity (liquid) (ASTM E1747 or ASTM D1945)

The parameters and analytical laboratory methods for groundwater sampling are listed below:

- Carbon dioxide (in-situ dissolved) (ASTM D513 or similar)
- Dissolved metals (EPA 200.8/200.9/7010 or similar) (laboratory filtered)
- Total dissolved solids (ASTM D5907 or similar)
- Major anions (EPA 300.1 or similar)
- Major cations (EPA 6020A/6020C/700B or similar)
- pH, temperature, DO, specific conductivity (calibrated in-situ instrument or portable meter)

The methodology for well casing corrosion sampling is listed below:

- ASTM G1-03 Corrosion or Corrosion Coupon by National Association of Engineers (NACE) International TM-01-69.

Sample containers, preservatives, reporting limits, and holding times are presented in Attachment C.

3.1.5 Quality Control Samples

Quality control (QC) sampling will consist of field quality control samples and laboratory quality control samples. Field quality control samples will consist of field duplicate samples collected at a frequency of 10 percent. Field equipment rinsate blanks or sample shipment trip blanks are not applicable for the groundwater analyte list proposed for this project (Section 3.1.3).

Laboratory QC samples include laboratory duplicates, laboratory control samples, and matrix-spike/matrix spike duplicates as specified by the analytical methodology for each parameter.

3.1.6 Sample Handling and Custody

Field samples will be collected directly into specified containers provided by the laboratory for each analysis. Samples will be uniquely labeled with date, time, and location and listed onto a standard laboratory chain-of-custody (COC) form. The COC form will double as the sample collection log. Samples will be secured into a water-resistant and temperature-controlled sample shuttles (coolers) along with appropriate container cushioning to avoid potential container breakage. Sample coolers will also contain packaged ice, dry ice, or manufactured ice (blue ice) as needed for temperature control as specified for each sample analysis. Onsite refrigerators with temperature control may also be used if available in preparation for packaging and offsite shipment to the laboratory.

COC documentation will be maintained with each sample cooler during sample collection and storage. Custody of sample cooler(s) is defined as within one's continual view or within a locked vehicle or locked storage area. Sample custody will be continually maintained and controlled between personnel with each transfer documented in the COC form. Laboratory shipments may be completed by commercial carrier as needed with proper shipment documentation and COC control.

3.1.7 Data Management and Reporting

SJR or a designated contractor will systematically compile and maintain project data and records as they are generated. Data will be electronic where possible and backed up on tape and held on secure servers. Data will be managed in a centralized electronic data management system. Electronic servers will be routinely maintained, updated, and backed-up to ensure the long-term preservation of project data and records. Project data and records includes field forms, analytical laboratory reports, instrument and equipment procurement records, calibration records, instrument manuals, analytical methodology, and related project information.

Calculations will be independently checked and confirmed and each analysis will be cross-checked for compliance with the approved methodology. Written documentation will provide a record of periodic QA reviews.

3.2 Measurement Performance and Acceptance Criteria

3.2.1 Field Instrumentation

Field instrumentation will be installed, calibrated and maintained according to the manufacturer's requirements and specifications. Only data measurements within the design range of the instrumentation will be accepted for project use.

3.2.2 Laboratory Reporting Limits

Laboratory reporting limits (RLs) are specified by the EPA, ASTM, or NACE analytical methodology and the laboratory performing the specified designated analysis. RLs will be specified in advance and only data within the specified range will be accepted for project use. In the event RLs are exceeded an assessment of the exceedance will allow for correction in the sampling or analytical methodology for subsequent analyses. Anticipated RLs are presented in Attachment C.

3.2.3 Data Validation and Usability

Laboratory reports will be comprehensively reviewed for accuracy and completeness regarding requested samples, methods, and RLs. QA blanks and duplicate data will be compared to original field sample data for comparability. An external commercial data validation service may be employed as needed to complete a systematic validation review and approval in order to formalize data usability. Rejected or qualified data, if any, will be clearly marked in reporting documents.

References

ASTM International, 2015. ASTM D3246-15, Standard Test Method for Sulfur in Petroleum Gas by Oxidative Microcoulometry, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, January 15.

ASTM International, 2017. ASTM G1-03 (17), Standard Practice for Preparing, Cleaning, and Evaluating Corrosion Test Specimens, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, November 1.

ASTM International, 2019. ASTM D6228-19, Standard Test Method for Determination of Sulfur Compounds in Natural Gas and Gaseous Fuels by Gas Chromatography and Flame Photometric Detection, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, April 1.

ASTM International, 2019. ASTM D1945-14 (19), Standard Test Method for Analysis of Natural Gas by Gas Chromatography, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, December 1.

ASTM International, 2019. ASTM E1747-95 (19), Standard Guide for Purity of Carbon Dioxide Used in Supercritical Fluid Applications, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, December 1.

Daniel B. Stephens & Associates, Inc. (DBS&A), 2021. San Joaquin Renewables, Class VI Permit Application, Testing and Monitoring Plan, prepared for San Joaquin Renewables LLC, McFarland, California, October 13.

EPA, 2012. Geologic Sequestration of Carbon Dioxide, Underground Injection Control (UIC) Program Class VI Well Project Plan Development Guidance. EPA 816-R-11-017, Office of Water (4606M), Washington, D.C., August 12.

National Association of Engineers (NACE) International/ASTM International, 2021. Standard Guide for Laboratory Immersion Corrosion Testing of Metals, NACE TM-01-69.

Attachment A



Hispec[®] HI5000

Downhole Pressure Transmitter



- Compact design
- NACE certified materials
- Silicon-on-sapphire sensor technology for outstanding stability
- High temperature up to 392 °F (200°C)
- High pressures up to 29,000 psi (2000 bar)
- All-welded and sealed construction for use in harsh and corrosive environments



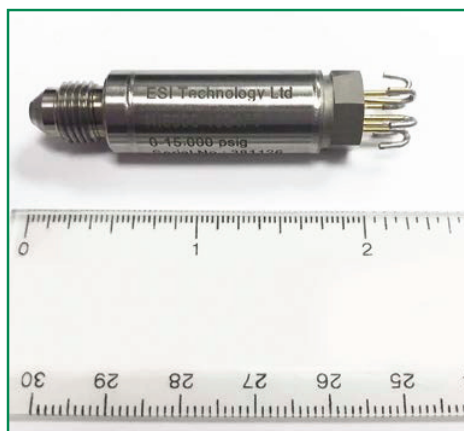
Description

The HI5000 transmitter, for downhole applications, is highly compact with a maximum length of 58mm.

The tough, corrosion-resistant design, using NACE certified materials, makes installation easy in challenging environments. The sensor is designed to withstand high shock and vibration inputs in high temperature applications which require accuracy, stability and long term performance of downhole pressure monitoring.

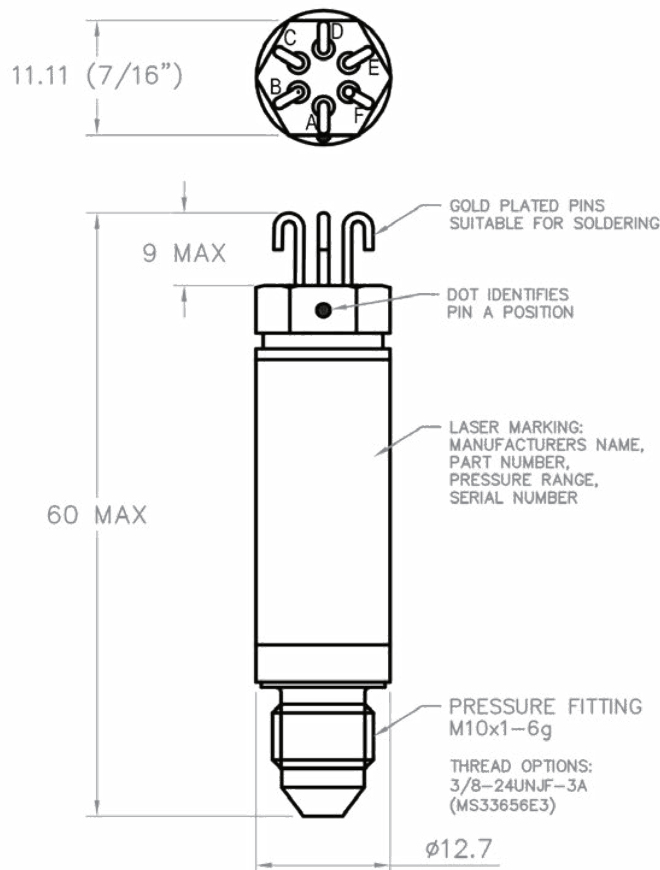
Dimensions

(in mm)



ELECTRICAL CONNECTION

| PIN | Designation |
|-----|--------------|
| A | + Excitation |
| B | + Signal |
| C | - Signal |
| D | - Excitation |
| E | RTD |
| F | RTD |



Technical Data

| Type | HI5000 |
|--|---|
| Sensor Technology: | Silicon-on-Sapphire |
| Pressure Range: | See Table 1 |
| Proof Pressure: | See Table 1 |
| Burst Pressure: | See Table 1 |
| Excitation: | 3-10 VDC (5 VDC Nominal) |
| Input Resistance: | 4000Ω ±1000Ω |
| Output Resistance: | 4000Ω ±1000Ω |
| Output at zero pressure over the calibrated pressure range: | ±8.0 mV/V |
| Full scale sensitivity (span) over the calibrated temperature range: | 10-20 mV/V Nominal |
| Operating Temperature Range: | -40°F to +392°F (-40°C to +200°C) |
| Calibrated Temperature Range: | 75°F to +356°F (+24°C to +180°C) |
| Non-linearity & Hysteresis Combined: | ±0.150 % of span maximum (Best Fit Straight Line method) |
| Total Error Band (Non-linearity, Hysteresis & Thermal Effects): | ± 0.20% of span, serial number specific polynomial model P(T,mV) provided for all input pressures and temperatures over the calibration range |
| Pressure Media: | Any compatible with NACE approved Titanium grade 5 and BT9 alloys (other materials available. Contact sales) |
| Weight: | 20g maximum (less than 1 oz.) |
| Process Connection Thread: | 3/8-24UNJF as per MS33656-E3 |
| Insulation resistance: | All connections pins together to case: 100 MΩ minimum at 50 VDC |
| Platinum Resistance Temperature Detector (RTD): | 0°C, 1000Ω ±0.06% to IEC 751 Class A, Alpha = 0.00385 nominal |
| Recommended Installation Torque: | 125 to 150 in-lb (14-17 Nm) |
| Calibration Data: | The calibration certificate supplied with each unit includes the coefficients for a 5th order polynomial calibration model |

Table 1

| MODEL NUMBER | PRESSURE RANGE [BARSG] | PROOF PRESSURE | BURST PRESSURE |
|--------------|------------------------|----------------|----------------|
| HI5000-0400 | 0-400 | 200% | 300% |
| HI5000-0600 | 0-600 | 200% | 300% |
| HI5000-1000 | 0-1000 | 150% | 200% |
| HI5000-1500 | 0-1500 | 110% | 150% |

DISCLAIMER: ESI Technology Ltd operates a policy of continuous product development. We reserve the right to change specification without prior notice. All products manufactured by ESI Technology Ltd are calibrated using precision calibration equipment, traceable to national measurement standards.

KPERM™ MULTI-DROP PIEZO DOWNHOLE GAUGE



SKU: MP203-030-406
Categories: [Advanced Monitoring](#), [Downhole Gauges](#), [Downhole Instrumentation](#), [KPerm™](#), [Kuster®](#), [Well Monitoring](#)

PRODUCT DESCRIPTION

Probe Multi-Drop Gauges are based on our field proven permanent piezo gauge technology. Up to 6 gauges can be run on a single TEC cable conductor. All gauges continuously provide accurate pressure and temperature data to surface, where it is displayed real-time via a single surface readout. The gauges are internally and externally E-beam welded, and designed for maximum shock and vibration resistance to enhance reliability and performance.

Ratings & Dimensions

| | |
|-----------------|---|
| Max temperature | 257° (125°/ 302°F (150°C) |
| Pressure Range | 3kpsi, 5kpsi, 10kpsi & 15kpsi |
| Outer diameter | 1.19 in (30.2 mm) |
| Length | 19.0 in (482 mm) |
| Weight | 3.5 lbs (1.59 kgs) |
| Materials | Nitronic 50 or 718 Inconel NACE MRO 175 |

Hardware Characteristics

| | |
|------------------|-----------------------------|
| Transducer type | Piezo resistive |
| Acquisition mode | Surface Readout Panel (SRO) |

Pressure Measurements

| | |
|----------------|-------------------------------|
| Pressure Range | 3kpsi, 5kpsi, 10kpsi & 15kpsi |
| Sampling Rate | 1 sps |
| Resolution | 0.0003% F.S. |
| Accuracy | 0.024% F.S. or 0.05% F.S. |
| Drift | < 3 psi / year |

Temperature Measurements

| | |
|-----------------|---------------|
| Max temperature | 302°F (150°C) |
|-----------------|---------------|

ONLINE TECHNICAL SPECIFICATION SHEET

Resolution
Accuracy

0.005% F.S.
 $\pm 1^{\circ}\text{C}$



Electrical Specification

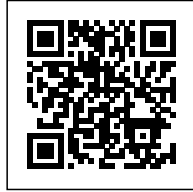
**Data Output
Interface**
Operating Voltage
Operating Current
Max Number of Gauges

Continuous data stream - MODBUS 485
KPerm SRO
24Vdc
12 - 34 mA
6

Version Control: 2021.12.14

On-line specifications are for REFERENCE ONLY and subject to change without notice. DO NOT USE FOR FIELD OPERATIONS.

RESERVOIR ANALYSIS SONDE SIGMA - HD - 1 11/16 IN.



SKU: RAS003

Categories: [Cased Hole Wireline](#), [Formation Evaluation](#), [HD Platform™](#), [Pulsed Neutron](#), [RAS](#)

PRODUCT DESCRIPTION

The RAS003 is a multi-detector pulsed neutron tool for measuring reservoir saturation using Sigma techniques. The sonde features an array of three Sodium Iodide (NaI) detectors. The Sigma measurement is based on the near and far spacings, the long spacing is sensitive to porosity and gas saturation.

The tool also operates in Oxygen Activation mode to determine water phase velocity (Water-Flow mode) and can be combined with up to four Gamma Ray-CCL (GCL) tools for this application.

The RAS003 is an HD platform tool, and as such can be run in combination with other HD tools such as Spectral Gamma, RADii, ProMAC and Production Logging tools.

Ratings & Dimensions

| | |
|------------------------|--|
| Diameter | 1.69 in (43.0 mm) |
| Length | 140.7 in (3573.0 mm) |
| Weight | 51.0 lb (23.0 kg) |
| Max temperature | 320°F (160°C) |
| Max pressure | 15,000 psi (103.4 mPa) |
| Measure Points | Near: 80.0 in (2032.0 mm) Far: 87.0 in (2210.0 mm) Long: 95.0 in (2413.0 mm) |
| Materials | Corrosion resistant materials used throughout |

Hardware Characteristics

| | | |
|-------------------------|-------------------------------|-----------------|
| Source Type | 3 detector array | |
| Sensor Type | Sodium Iodide (NaI) detectors | |
| Acquisition Mode | Real-time with TCU | Memory with MLT |

Measurements

| | |
|-------------|---|
| Type | Sigma, Oxygen Activation, Inelastic Gas |
|-------------|---|

IQ™ MAGNETIC PROPERTIES TOOL - PTX - 2 3/4 IN.



SKU: 050-CI275-0001

Categories: [Cased Hole Wireline](#), [Electro-Magnetic Thickness](#), [iQ](#), [PTX](#), [Well Integrity](#)

PRODUCT DESCRIPTION

The 4-segment receiver of the iQ™ Magnetic Properties Tool (PTX) measures the casing in 90° sections (quadrants). The tool produces a magnetic field that opposes the primary field casing attenuation and phase shift. The magnitude of the measured phase shift is a function of the electrical conductivity, magnetic permeability and metal thickness of the field being measured. Multiple coil spacing and frequencies control the depth of investigation and measure the electromagnetic properties of the casing, that yield a quantitative casing thickness and internal diameter measurements.

Ratings & Dimensions

| | |
|-------------------------|---|
| Max Temperature | 350°F (177°C) |
| Maximum Pressure | 20,000 psi (138 MPa) |
| Outer Diameter | 2.75 in (69.85 mm) |
| Length | 75.0 in (1905.0 mm) |
| Weight | 70.0 lb (31.75 kg) |
| Csg/Tbg OD | Min: 3.5 in (89.0 mm) Max: 7.0 in (178.0 mm) |
| Tensile Strength | Tension: 15,000 lb Compression: 15,000 lb |
| Measure Points | Casing Thickness: 24.5 in (639 mm) Dift'I Thickness: 32.7 in (828 mm) Caliper: 25.0 in (635 mm) |

Borehole Conditions

| | |
|-------------------------|---|
| Tool Positioning | Centralized |
| Logging Speed | Recommended: 30 ft (9.1 m) /min Max: 60ft (318.2 m) /min |

Hardware Characteristics

| | |
|---------------------|--|
| Source Type: | Single and multi frequency AC coils Azimuthal thickness gauge with quadrant sensitivity |
| Sensor Type | Multi-frequency caliper and casing properties 3-axis accelerometer for tool orientation |
| Connections | E-Line 'GO' Type |

ONLINE TECHNICAL SPECIFICATION SHEET

Combinability

GR, CCL, MAC, Radii Bond Tool



Electrical Specification

Current + 45 mA @ 130V

Measurements

| | Casing Thickness | Casing Caliper |
|-----------------------------|--|-----------------|
| Principle | Remote-field EC | Near-field EC |
| Range | 0 to 1.50 in | 3.50 to 7.00 in |
| Azimuthal Resolution | 4 sectors | NA |
| Vertical Resolution | 1.56 in | 1.00 in |
| Sensitivity | 1% (2 inch through-hole) | 1% |
| Accuracy | ±1% | |
| Primary Curves | Casing & differential thickness | Casing ID |
| Secondary Curves | 3-axis accelerometer, internal temperature, casing electrical properties | |

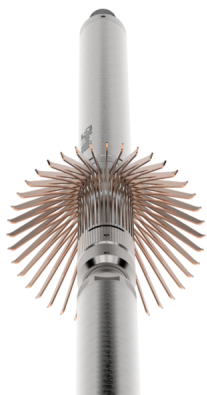
Calibration

Primary & Wellsite Sections of API casing in different weights

Version Control: 2021.12.16

On-line specifications are for REFERENCE ONLY and subject to change without notice. DO NOT USE FOR FIELD OPERATIONS.

PROMAC™ 40 | MULTI-ARM CALIPER TOOL - HD - 2 3/4 IN.



SKU: 050-MAC40-1100
Categories: [Caliper](#), [Cased Hole Wireline](#), [HD Platform™](#), [Multi-Arm Calipers](#), [ProMAC](#), [Well Integrity](#)

PRODUCT DESCRIPTION

The latest generation ProMAC™ series 40-arm caliper tool incorporates a series of mechanical, electrical and electronic design features that greatly increase tool accuracy, reliability, maintainability and overall cost efficiency.

Ratings & Dimensions

| | |
|------------------|---|
| Max Temperature | 350°F (177°C) |
| Max Pressure | 20,000 psi (138 MPa) |
| Diameter | 2.75 in (69.9 mm) |
| Length | 63.66 in (1,617 mm) |
| Weight | 66 lb (29.9 kg) |
| Tensile Strength | Connection: 15,000 lbF Body: 20,000 lbF |
| Measure Points | Caliper: 33.85 in (860 mm) from bottom of tool |
| | Inclination: 52.4 in (1331 mm) from bottom of tool |
| Materials | Corrosion resistant materials used throughout |

Hardware Characteristics

| | |
|------------------|---|
| Sensor Type | Inclinometer: 3-axis accelerometer |
| Combinability | Caliper: Differential Variable Reluctance Transducer |
| Tool Positioning | All HD tools: GR, CCL, iQ, RADii, RAS, PLT |
| Acquisition Mode | Centralized |
| | SRO w/ TCU Mem w/ MLT |

Electrical Specification

| | | |
|---------|--------|---------------------------|
| Voltage | SRO | 50V DC |
| | Memory | 19.2V DC |
| Current | SRO | 40mA(log) 100mA(opening) |
| | Memory | 104mA(log) 260mA(opening) |

RADII® CEMENT BOND TOOL - HD - 2 3/4 IN.



SKU: 050-RB275-1000

Categories: [Cased Hole Wireline](#), [Cement Evaluation](#), [HD Platform™](#), [RADii](#), [Well Integrity](#)



PRODUCT DESCRIPTION

The medium diameter RADii® HD Segmented Cement Bond Tool uses a single ceramic transmitter, an eight segment receiver at 3 ft. and a single receiver at 5 ft. spacing. The segmented receiver generates a cement map which enables identification of cement channeling while the single receiver generates the traditional cement bond log (CBL) and a variable-density log (VDL).

Ratings & Dimensions

| | |
|-------------------------|--|
| Max Temperature | 350°F (177°C) |
| Maximum Pressure | 15,000 psi (103.42 MPa) |
| Outer Diameter | 2.75 in (69.85 mm) |
| Length | 8.73 ft (2.66 m) |
| Weight | 93 lb (42.18 kg) |
| Min Csg/Tbg OD | 4.5 in (115.0 mm) |
| Max Csg/Tbg OD | 11.6 in (295.0 mm) |
| Tensile Strength | Tension: 50,000 lb Compression: 35,000 lb |
| Materials | SST |
| Measure Points | Amplitude, TT: 4.3 ft (1.3 m) VDL, Signature: 3.3 ft (1.0 m) |

Borehole Conditions

| | |
|-------------------------|---|
| Borehole Fluids | Salt, Fresh and Oil |
| Tool Positioning | Centralized with one each centralizer above and below |

Hardware Characteristics

| | |
|----------------------|--|
| Source Type: | One piezoelectric crystal fired at 20 kHz, 50 msec intervals |
| Sensor Type | Omni Receiver: One 20 kHz piezoelectric Radial Receiver: One 8 segment 20 kHz piezoelectric |
| Connections | Top: GOI box Bottom: GOI pin |
| Combinability | GR, CCL, ProMac, iQ, Temperature |

Acquisition Mode

SRO w/ TCU Mem w/ MLT



Current

45 mA @ 130V

Version Control: 2021.11.16

On-line specifications are for REFERENCE ONLY and subject to change without notice. DO NOT USE FOR FIELD OPERATIONS.

Attachment B

Kuster Flow Through Sampler (FTS)

Product Reference: 11700-100

The Kuster Flow Through Sampler (FTS) is a device for obtaining fluid samples from a producing well.

The sample chamber is lowered into the well with open valves on each end, allowing well fluids to pass freely through the chamber. At an interval programmed on the surface, the valves close, trapping the fluid. The sampler can then be removed from the well. The sample contained in the chamber will remain in the same state as it was in the well. The pressure will not be changed. The sample can then be removed from the sampler and transferred to a container suitable for storage.

The instrument consists of a sample chamber with a spring-loaded valve on each end. A latching mechanism connects the valves together and holds them open. Above the chamber, there is a clock to program the closing time, and a ball operated tripping mechanism to release the valves. The lower end has a removable bull nose with ports to allow the fluid to enter. At the top, there is a rope socket for attaching the wireline.

SPECIFICATIONS - KUSTER FLOW THROUGH SAMPLER (FTS)

| | | | | |
|-------------------------------|------------|----------|-----------------------|--------------------------------------|
| Outside diameter (O.D.) | 1 1/2" | 3.81 cm | Seal Material | VITON |
| Length | 87" | 2.20 m | Material | 17-4 PH/SS Monel |
| Operating Environment: | | | PH | 2, 9-9 |
| | | | Salinity | 300,000 ppm |
| Maximum Pressure | 10,000 psi | 68.9 MPa | Miscellaneous: | |
| Maximum Temperature | 450 °F | 232.2 °C | | |
| Capacity | 600 cc | | | |
| | | | Clocks | Programmable for 1, 2, 5 and 6 hours |
| | | | Transfer Method | Manual bleed-off |

RELATED PRODUCTS

- 18600-XXX Carrying Case
- 18600-XXX Field Tool Kit
- 18600-XXX Spare parts kit



Note: Description and specifications are subject to change without notice.

At Probe, we design, manufacture and service specialized modular downhole tools and systems. Our tools are used in formation evaluation, well integrity assessment and well productivity determination across the global energy industry.

HYDRASleeve

US Patents No. 6,481,300; No. 6,837,120; No. 9,726,013 others pending

NO PURGE GROUND WATER SAMPLER

By more effectively sampling groundwater, especially in low-yield wells, the new HydraSleeve "No Purge" ground water sampler can cut field sampling costs in half! The low-cost, disposable HydraSleeve captures a "core" of water from any discrete interval in the screened portion of the well with no change in water level and minimal disturbance to the water column. HydraSleeve is sealed except during sample collection, then re-seals itself, assuring that a representative sample is recovered. The low-profile HydraSleeve can be fabricated in various sizes to match well and sampling requirements. HydraSleeve makes ground water sampling a simple, three-step operation.

FEATURES:

EFFECTIVE

- Sample for ALL compounds
- Best sampler for slow recharge wells
- Repeatable sampling method
- Lower turbidity than purge and sample
- Slim cross section minimizes disturbance

INEXPENSIVE

- Reduces field sampling costs by 50% - 80%
- No purge water disposal
- No expensive equipment

FAST

- Collect samples in less than 15 minutes
- Cuts total field time by half or more
- No decontamination

EASY TO USE

- No training or special tools required
- Small, convenient and simple shipping

USES

- Long term ground water monitoring
- Sample low-yield wells
- Determine dissolved containment fraction
- Sample crooked or constricted wells
- Vertically define contaminant concentrations



EMPTY

FULL

Simple by Design

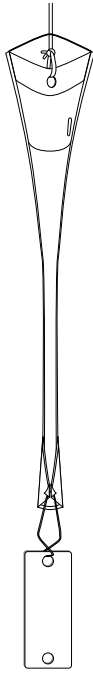
www.hydrasleeve.com

HOW IT WORKS

ONE

Placing Sampler

HydraSleeve is lowered into place and positioned in the well screen. Water pressure keeps bag collapsed and check valve closed, preventing water from entering sampler. Well is allowed to return to equilibrium.



TWO

Sample Collection

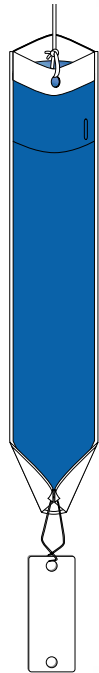
HydraSleeve fills when the check valve is moved upward faster than 1 fps. It fills by continuous upward movement. When moving upward, the check valve opens and fluid flows into the bag. There is no change in well water level and minimum sample agitation during collection.



THREE

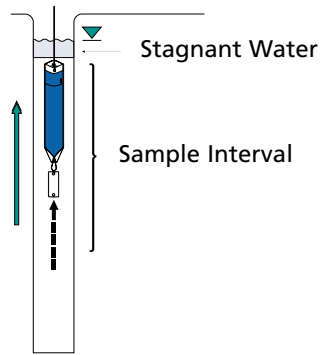
Sample Retrieval

Flexible bag is full and check valve closed. Sampler is recovered without entry of extraneous, over-lying fluids. Note: Several HydraSleeves may be stacked on the suspension cable for vertical profiling.

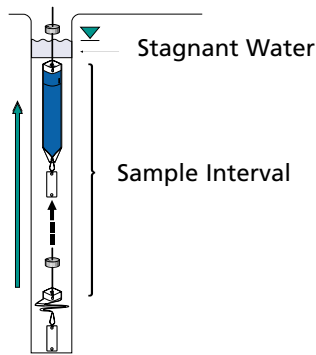


METHODS OF SAMPLING WITH THE HYDRASLEEVE

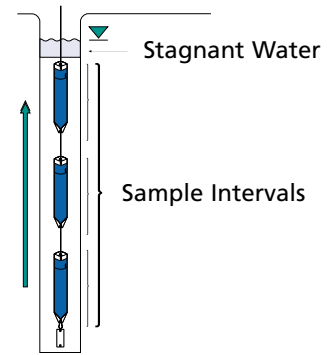
Continuous Pull - Bottom Weight



Continuous Pull - Top Weight



Vertical Profiling Multiple Samplers



HydraSleeve Specifications

General Specifications

Sample Sleeve Layflat Width
Filled Sample Sleeve Diameter
Total Volume for 30-inch HydraSleeve
Sampler Tensile Strength
Standard Sample Sleeve Material

Volume Displaced

8 oz. SS weight
30-inch Empty Sleeve (approx.)
Total, 8 oz. Weight and 30-inch Empty Sleeve (approx.)

2-inch

Fits 2-inch and larger wells

2.5 inches
1.5 inches
650 ml
25-35 lb
Virgin 4 mil PE

4-inch

Fits 4-inch and larger wells

4 inches
2.6 inches
1250 ml
25-35 lb
Virgin 4 mil PE

(optional) 16 oz. Top Weight

25 ml

25 ml

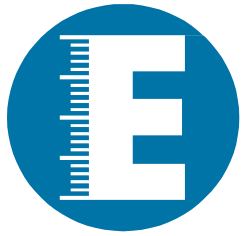
Sample Collection

Single Pull Distance to Fill @ 1-2 fps

30 inches (length of sampler)

30 inches (length of sampler)

(HydraSleeve available in custom sizes to maximize volume.)



www.eonpro.com

EON Products, Inc.

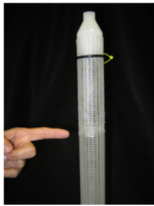
Your source for
Sampling, Measuring,
& Monitoring
Solutions



Passive Diffusion Sampling for VOCs, SVOCs, Metals, Inorganics, Ions

Passive Diffusion Bag Samplers (PDBs) have been used worldwide to collect groundwater samples for Volatile Organic Compounds (VOCs) in groundwater since 1998. Lab and field case studies demonstrate that PDBs produce accurate sample concentrations and provide cost savings of 50 to 80% compared to low-flow and volume purge. PDBs also allow for discrete interval sampling and a reduced carbon footprint compared to pumping and bailing.

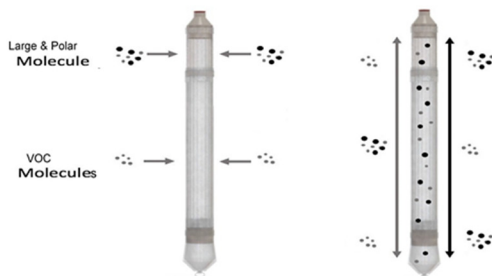
Expanding the List of Analytes Sampled By PDBs



Until now, the reliable and economical use of passive diffusion sampling has been limited to non-polar VOCs because large or polar molecules and ions cannot pass through the polyethylene membrane into the sampler. EON's Dual-Membrane Passive Diffusion (DMPDB) sampler operates under *the same principles as the well established PDB sampling*, using two semi-permeable membranes in a single sampler, to capture an expanded list of compounds.

What is the Principle?

Two separate semi-permeable membranes are aligned in series to form a tubular sample chamber. The sampler is filled with de-ionized water and lowered into the well screen intercepting groundwater flow. When the surrounding groundwater contains molecules that are not in the sampler, a concentration gradient drives the molecules in the groundwater to diffuse through the membrane pores into the sampler. The bottom membrane, having smaller pores, allows diffusion of VOCs from the surrounding groundwater into the sampler but does not allow water molecules to pass. The upper membrane, with larger pores, allows diffusion of large or polar molecules into the sampler.



Molecules that enter the sampler through either membrane diffuse throughout the water inside of the sampler until dynamic equilibrium is reached within the sampler and with the surrounding groundwater. When the sampler is retrieved, water in the top membrane leaves the sampler through the large pores, while the lower chamber serves as a reservoir and retains the thoroughly diffused sample until discharged for analysis.

Benefits

- Reduce cost of sample acquisition by 50-80%
- Sample Volume up to 650 ml per sampler
- Depth Discrete Interval Sampling
- Also Sample for 1,4 Dioxane & PFAS
- Virtually NO Investigation Derived Waste Water (IDW)

Is the Dual Membrane PDB a Proven Sampling Method?

Yes. The Dual-Membrane PDB sampler (DMPDB) was developed by combining the functionality of passive sampling devices that were evaluated by the ITRC Passive Sampling Team in the mid 2000's and found effective for sampling a wide range of compounds. Each of the methods performed well but some were not user friendly or did not produce adequate sample volume or were too expensive to commercialize. The DMPDB enables sampling for a wide range of compounds in a simple and effective way using the passive diffusion technology developed by the U.S.G.S. Since its initial use by the USEPA, the DMPDB has undergone extensive laboratory bench testing, followed by field use, validating the DMPDB's effectiveness at producing samples that represent concentrations of contaminants in surrounding groundwater fluid.

Bench-tests were performed using the DMPDBs to sample for a variety of analytes including; VOCs, Metals, Ions, and compounds of emerging concern such as 1,4 dioxane and PFAS. A large sample chamber representing a well, was spiked with compounds of interest, DMPDB samplers were installed, and the chamber sealed. The samplers were left in place for adequate time (about three weeks) to allow for the diffusion process to come to equilibration. Control samples were then taken from the fluid in the chamber surrounding the samplers. Next, the samplers were removed, and the contents discharged to laboratory bottles and sent to a certified lab for analysis. The resulting data from the DMPDB samples shows high correlation with the analyte concentrations from the control samples representing the water in the chamber, affirming diffusion sampling, using the Dual Membrane Passive Diffusion Sampler, produces accurate concentrations for a wide range of compounds.

In 2014 & 2015 the USEPA Region VI performed multiple, side by side field evaluations of the Dual-Membrane PDB on 2 sites manage. After the evaluation the DMPDB was adopted to replace the expensive and time consuming low-flow sampling for metals and ions on those sites. Hexavalent chromium was one of the key metals of concern and the results from Dual-Membrane sampler were in line with long term trends and with the side by side low flow results.

In 2016 and 2017 the Dual-Membrane PDB was evaluated for specific VOC compounds and a range of metals by the USGS and a private consultant at a U.S. Air Force base. The USGS used the samplers in wells that were over 1,000 feet deep and the results favorably compared to bailed samples. The private consultant sampled wells that were 300 to over 500 ft deep and obtained VOC and metals data that were consistent with the data taken using submersible pumps and the low flow method. The resulting data comparisons enabled the site to remove the troublesome low-flow pumps and tedious deep-well bailing and adopt passive sampling using the Dual-Membrane Passive Diffusion Sampler.

The Dual-Membrane Passive Diffusion Sampler has also been evaluated and adopted at private commercial sites, based on successful side by side comparisons with more costly sampling methods including low-flow pumping and bailing.

How Are They Deployed?

Like PDBs, the Dual-Membrane PDB sampler is installed on a re-usable weighted suspension tether, secured to the underside of the well cap.

Want to Know More about Passive Sampling?

Since EON first commercialized the PDB in 1998, we have been the leader in passive sampling. Contact EON by email: sales@eonpro.com or phone: 800-474-2490 / 770-978-9971

3230 Industrial Way SW, Suite B • Snellville, GA 30039

www.eonpro.com

Telephone: 800.474.2490 or 770-978-9971; fax: 770-978-8661

Attachment C

TRI Analytical Methods

| Analyte | Analysis Method | Level of Accuracy | Level of Precision | Minimum Detection Limit | Maximum Detection Limit |
|--|---|--|------------------------|---|---|
| Carbon Monoxide | Gas Chromatography with catalytic conversion then flame ion detector or pulse discharge ionization detector | 5% or ± 0.5 ppm, whichever is greater | $\pm 3\%$ | 0.5 ppm (FID) 0.1 ppm (PDID) | 99.999% (PDID) |
| Carbon Dioxide | Gas Chromatography with catalytic conversion then flame ion detector or pulse discharge ionization detector | 5% or ± 5 ppm, whichever is greater | $\pm 3\%$ | 20 ppm (FID) 0.1 ppm (PDID) | 99.999% (PDID) |
| Methane | Gas Chromatography with flame ion detector or pulse discharge ionization detector | 5% or ± 1 ppm, whichever is greater | $\pm 3\%$ | 1 ppm (FID) 0.1 with (PDID) | 99.999% (PDID) |
| Total Gaseous Hydrocarbons | Gas Chromatography with flame ionization detector | 5% or ± 1 ppm, whichever is greater | $\pm 5\%$ | 1 ppm | 2,000 ppm |
| Helium | Gas Chromatograph with pulse discharge ionization detector | 2% or ± 0.1 ppm, whichever is greater | $\pm 2\%$ | 0.1 ppm | 99.999% (PDID) |
| Hydrogen | Gas Chromatography with thermal conductivity detector or pulse discharge ionization detector | 2% or ± 0.1 ppm, whichever is greater | $\pm 2\%$ (TCD & PDID) | 0.5%(TCD) 0.1ppm (PDID) | 99.999% (PDID) |
| Oxygen | Gas Chromatography with thermal conductivity detector or pulse discharge ionization detector | $\pm 2\%$ of concentration or 0.5% absolute whichever is greater | $\pm 2\%$ (TCD & PDID) | 0.5%(TCD) 0.1ppm (PDID) | 99.999% (PDID) |
| Nitrogen | Gas Chromatography with thermal conductivity detector or pulse discharge ionization detector | $\pm 2\%$ of concentration or 0.5% absolute whichever is greater | $\pm 2\%$ (TCD & PDID) | 0.5%(TCD) 0.1ppm (PDID) | 99.999% (PDID) |
| Condensed Hydrocarbons (Oil Mist and Particulates) | Standard Gravimetric, with hexane extraction for oil mist if results are within 90% of specification | ± 0.1 mg/m ³ | $\pm 1\%$ | 0.01 mg/m ³ (less on request) | Varies |
| Moisture Dewpoint | Color indicator tube with critical orifice to measure air flow | $\pm 4^\circ\text{F}$ at -65°F $\pm 30\%$ | $\pm 30\%$ | -95°F (-70°C) | 20°F (-6°C) |
| Moisture ppmv | Color indicator tube with critical orifice to measure air flow | ± 8 ppm at 24 ppm $\pm 30\%$ | $\pm 30\%$ | 2 ppm | 3500 ppm |



TRI Analytical Methods

| Analyte | Analysis Method | Level of Accuracy | Level of Precision | Minimum Detection Limit | Maximum Detection Limit |
|--|--|---------------------------------------|--------------------|----------------------------------|-------------------------|
| Nitrous Oxide | Gas Chromatograph with catalytic converter followed by flame ionization detector | $\pm 0.5\%$ or 5000 ppm $\pm 30\%$ | $\pm 2\%$ | 5000 ppm | 99.5% |
| Nitrogen Dioxide | Color indicator tube with critical orifice to measure air flow | $\pm 30\%$ | $\pm 20\%$ | 0.1 ppm | 1.0 ppm |
| Sulphur Dioxide | Color indicator tube with critical orifice to measure air flow | $\pm 30\%$ | $\pm 20\%$ | 0.1 ppm | 3 ppm |
| Hydrocarbon Panel Identification (C1-C13 species) | Gas Chromatograph with mass selective detector | $\pm 10\%$ | $\pm 10\%$ | 0.3 ppm | Varies |
| Halogenated Solvents (Freon TF, 111-Trichloroethane, and others) | Gas Chromatography with electron capture detector | $\pm 10\%$ | $\pm 10\%$ | 0.01 ppm | 10 ppm |
| Halogenated Hydrocarbons (Freon TF, 111-Trichloroethane, and others) | Gas Chromatography with electron capture detector | $\pm 10\%$ | $\pm 10\%$ | 0.1 ppm | Varies |
| Execution of ISO 8573 OIL Vapor Method | Gas Chromatography with mass selective detector | $\pm 10\%$ | $\pm 10\%$ | 1 ppm or 0.002 mg/m ³ | Varies |
| Particle Counting and Sizing | Laser Particle Counter 3100 | $\pm 10\%$ | $\pm 10\%$ | 0.3 micron | 25.0 micron |
| Particle Counting and Sizing | Laser Particle Counter 1100 | $\pm 10\%$ | $\pm 10\%$ | 0.1 micron | 1.0 micron |

Jason Vandagriff

Jason Vandagriff, Laboratory Director



Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove, CA 92841

Prepared for:

John Dodge
Daniel B. Stephens & Associates Inc.
3150 Bristol Street
Suite 210
Costa Mesa, CA 92626
JDodge@Geo-Logic.com

Prepared by Schwartz, Eydie
Date 12/28/2021
Expiration Date 6/17/2022
Est. Start Date 12/17/2021

Project: EPA Water Samples

Quote Number: 57009720 - 1

Water

| Matrix | Method | Test Description | Analyte | RL | MDL | Units |
|--------|---------|---|----------------|---------|----------|-------|
| Water | RSK-175 | RSK-175 CO2 | Carbon dioxide | 5.00 | 2.78 | ug/L |
| Water | 200.8 | Total Metals 23 compounds (Includes Ca, Na, K, Mg) | Aluminum | 0.0500 | 0.0106 | mg/L |
| | | | Antimony | 0.00100 | 0.000500 | mg/L |
| | | | Arsenic | 0.00100 | 0.000630 | mg/L |
| | | | Barium | 0.00100 | 0.000160 | mg/L |
| | | | Beryllium | 0.00100 | 0.000210 | mg/L |
| | | | Cadmium | 0.00100 | 0.000980 | mg/L |
| | | | Calcium | 0.100 | 0.0366 | mg/L |
| | | | Chromium | 0.00100 | 0.000580 | mg/L |
| | | | Cobalt | 0.00100 | 0.000170 | mg/L |
| | | | Copper | 0.00100 | 0.000610 | mg/L |
| | | | Iron | 0.0500 | 0.0222 | mg/L |
| | | | Lead | 0.00100 | 0.000190 | mg/L |
| | | | Magnesium | 0.0500 | 0.0170 | mg/L |
| | | | Manganese | 0.00100 | 0.000440 | mg/L |
| | | | Nickel | 0.00100 | 0.000540 | mg/L |
| | | | Potassium | 0.0500 | 0.0257 | mg/L |
| | | | Selenium | 0.00100 | 0.000780 | mg/L |
| | | | Silver | 0.00100 | 0.000280 | mg/L |
| | | | Sodium | 0.100 | 0.0397 | mg/L |
| | | | Thallium | 0.00100 | 0.000180 | mg/L |
| | | | Vanadium | 0.00100 | 0.000200 | mg/L |
| | | | Zinc | 0.00500 | 0.00347 | mg/L |
| Water | 200.8 | Dissolved Metals 23 compounds (Includes Ca, Na, Aluminum K, Mg) | | 0.0500 | 0.0106 | mg/L |
| | | | Antimony | 0.00100 | 0.000500 | mg/L |
| | | | Arsenic | 0.00100 | 0.000630 | mg/L |
| | | | Barium | 0.00100 | 0.000160 | mg/L |
| | | | Beryllium | 0.00100 | 0.000210 | mg/L |
| | | | Cadmium | 0.00100 | 0.000980 | mg/L |
| | | | Calcium | 0.100 | 0.0366 | mg/L |
| | | | Chromium | 0.00100 | 0.000580 | mg/L |
| | | | Cobalt | 0.00100 | 0.000170 | mg/L |
| | | | Copper | 0.00100 | 0.000610 | mg/L |
| | | | Iron | 0.0500 | 0.0222 | mg/L |
| | | | Lead | 0.00100 | 0.000190 | mg/L |
| | | | Magnesium | 0.0500 | 0.0170 | mg/L |
| | | | Manganese | 0.00100 | 0.000440 | mg/L |

Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove, CA 92841

Prepared for:

John Dodge
Daniel B. Stephens & Associates Inc.
3150 Bristol Street
Suite 210
Costa Mesa, CA 92626
JDodge@Geo-Logic.com

Prepared by Schwartz, Eydie
Date 12/28/2021
Expiration Date 6/17/2022
Est. Start Date 12/17/2021

Project: EPA Water Samples

Quote Number: 57009720 - 1

Water

| Matrix | Method | Test Description | Analyte | RL | MDL | Units |
|------------------|----------|------------------------|------------------------------|---------|----------|-------|
| Continued | | | | | | |
| | | | Nickel | 0.00100 | 0.000540 | mg/L |
| | | | Potassium | 0.0500 | 0.0257 | mg/L |
| | | | Selenium | 0.00100 | 0.000780 | mg/L |
| | | | Silver | 0.00100 | 0.000280 | mg/L |
| | | | Sodium | 0.100 | 0.0397 | mg/L |
| | | | Thallium | 0.00100 | 0.000180 | mg/L |
| | | | Vanadium | 0.00100 | 0.000200 | mg/L |
| | | | Zinc | 0.00500 | 0.00347 | mg/L |
| | | | | RL | MDL | Units |
| Water | SM 2540C | Total Dissolved Solids | Total Dissolved Solids | 1.00 | 0.870 | mg/L |
| | | | | RL | MDL | Units |
| Water | 300.0 | Br, Cl, F, SO4 | Bromide | 0.100 | 0.0410 | mg/L |
| | | | Chloride | 1.00 | 0.359 | mg/L |
| | | | Fluoride | 0.100 | 0.0460 | mg/L |
| | | | Sulfate | 1.00 | 0.237 | mg/L |
| | | | | RL | MDL | Units |
| Water | 300.0 | NO2, NO3, o-PO4 | Nitrite as N | 0.100 | 0.0180 | mg/L |
| | | | Nitrate as N | 0.100 | 0.0240 | mg/L |
| | | | Orthophosphate as P | 0.100 | 0.0760 | mg/L |
| | | | | RL | MDL | Units |
| Water | SM 2320B | Alkalinity - All Forms | Alkalinity, Total (As CaCO3) | 5.00 | 2.18 | mg/L |
| | | | Bicarbonate (as CaCO3) | 5.00 | 2.18 | mg/L |
| | | | Carbonate (as CaCO3) | 5.00 | 2.18 | mg/L |
| | | | Hydroxide (as CaCO3) | 5.00 | 2.18 | mg/L |

Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove, CA 92841

Prepared for:

John Dodge
Daniel B. Stephens & Associates Inc.
3150 Bristol Street
Suite 210
Costa Mesa, CA 92626
JDodge@Geo-Logic.com

Prepared by Schwartz, Eydie
Date 12/28/2021
Expiration Date 6/17/2022
Est. Start Date 12/17/2021

Project: EPA Water Samples

Quote Number: 57009720 - 1

Analytical Sample Information

| Analysis Method | Matrix | Preservative | Client Sub List Desc Container | Volume Required | Holding Time |
|--|--------|--------------|--|-----------------|--------------|
| Alkalinity 2320B | Water | None | Alkalinity - All Forms Plastic 250ml - unpreserved | 200 mL | 14 Days |
| Anions, Ion Chromatography 300_ORGFM_28D | Water | None | Br, Cl, F, SO4 Plastic 250ml - unpreserved | 10 mL | 28 Days |
| Anions, Ion Chromatography 300_ORGFMS | Water | None | NO2, NO3, o-PO4 Plastic 250ml - unpreserved | 10 mL | 48 Hours |
| Dissolved Gases (GC) RSK_175_CO2 | Water | None | RSK-175 CO2 Voa Vial 40ml - unpreserved | 80 mL | 7 Days |
| Metals (ICP/MS) 200.8 | Water | None | Dissolved Metals 23 compounds (Includes Ca, Na, K, Mg) Plastic 250ml - unpreserved | 100 mL | IMMEDIATELY |
| Metals (ICP/MS) 200.8 | Water | Nitric Acid | Total Metals 23 compounds (Includes Ca, Na, K, Mg) Plastic 250ml - with Nitric Acid | 50 mL | 180 Days |
| Solids, Total Dissolved (TDS) 2540C_Calcd | Water | None | Total Dissolved Solids Plastic 250ml - unpreserved | 50 mL | 7 Days |

Hold Times listed above represent the minimum allotted time between sampling and lab extraction, prep or analysis.

Multiple analyses may be consolidated into fewer containers. Please contact your Project Manager for clarification when requesting sample containers.

Except for some special tests, all samples should be kept cold at 6 degrees C.